What is claimed is:

1. An organometallic compound having bonds between metal atoms and nitrogen atoms or bonds between semimetal atoms and nitrogen atoms, wherein, the chlorine content of 200 ppm or less and the water content of 30 ppm or less.

2. An organometallic compound according to claim 1, wherein the general formula of the compound is represented by the following formula (1):

$$M[(R^1)_2N]_{(n-s)}(R^2)_s \qquad (1)$$

(wherein, M represents a metal atom or semimetal atom, with the metal atom being Hf, Zr, Ta, Ti, Ce, Al, V, La, Nb or Ni, and the semimetal atom being Si, R^1 represents a methyl group or ethyl group, R^2 represents an ethyl group, n represents the valence of M, and s represents an integer of 0 to n-1).

3. An organometallic compound according to claim 2, wherein when M is Hf in formula (1), the chlorine content in the compound is 200 ppm or less and the water in the compound content is 30 ppm or less.

4. An organometallic compound according to claim 2, wherein when M is Si in formula (1), the chlorine content in the compound is 1 ppm or less and the water content in the compound is 30 ppm

or less.

5. A synthesis method of an organometallic compound comprising:

obtaining a crude product of an organometallic compound by using a metal-containing compound and aminolithium;

distilling said crude product under reduced pressure in a vacuum distillation step to obtain a purified product of said organometallic compound; and,

remoing impurities contained in the purified product in an impurity removal step using flash chromatography following said vacuum distillation step.

6. A synthesis method according to claim 5, wherein said impurity removal step comprises:

forming a filler layer inside a pressure-resistant column by filling into said column a slurry prepared by adding a filler to a developing solvent;

injecting said purified product into a top of the filler layer; and,

passing said purified product through the filler layer by supplying a pressurized gas at a predetermined flow rate into the column from a top of the column to adsorb impurities contained in said purified product in the filler layer.

7. A synthesis method according to claim 5, wherein said

impurities removed from the purified product are chlorine and water.

8. A synthesis method according to claim 6, wherein said impurities removed from the purified product are chlorine and water.

9. A synthesis method according to claim 6, wherein said developing solvent is at least one organic solvent selected from the group consisting of n-alkane, diethyl ether and dichloromethane, and a water content in the organic solvent is 30 ppm or less.

10. A synthesis method according to claim 6, wherein said filler in the column comprises at least one type of particle selected from the group consisting of SiO_2 particles, Al_2O_3 particles, ZrO_2 particles, TiO_2 particles and HfO_2 particles having a mean particle diameter of 0.3-0.5 μm, and a particle size distribution width d_{90}/d_{10} of 0.8-1.2.

11. A synthesis method according to claim 6, wherein said pressure-resistant column is a glass column having a diameter of 10-20 cm and a height of 30-50 cm.

12. A synthesis method according to claim 10, wherein said

pressure-resistant glass column is filled with 500-1000 g of column filler.

13. A synthesis method according to claim 11, wherein said pressure-resistant glass column is filled with 500-1000 g of column filler.

14. A synthesis method according to claim 6, wherein the pressurized gas is Ar gas, a pressure of the pressurized gas is 1-2 kg, and a column flow rate has a spatial velocity (SV value) of 2-4 cm/min.

15. A synthesis method according to claim 5, wherein said metal-containing compound is hafnium chloride, zirconium chloride, tantalum chloride, titanium chloride, cerium chloride, vanadium chloride, lanthanum chloride, niobium chloride, nickel chloride or silane tetrachloride.

16. A synthesis method according to claim 5, wherein said aminolithium is obtained by reacting one of dimethylamine and diethylamine with n-butyllithium.

17. A synthesis method according to claim 5, wherein when said metal-containing compound is hafnium chloride, the resulting organometallic compound is one of tetraquis

(dimethylamino)hafnium and tetraquis(diethylamino)hafnium.

18. A synthesis method according to claim 15, wherein when said metal-containing compound is hafnium chloride, the resulting organometallic compound is one of tetraquis (dimethylamino)hafnium and tetraquis(diethylamino)hafnium.

19. A synthesis method according to claim 5, wherein when the metal-containing compound is silane tetrachloride, the resulting organometallic compound is one of tetraquis (dimethylamino)silane and tetraquis(diethylamino)silane.

20. A synthesis method according to claim 15, wherein when the metal-containing compound is silane tetrachloride, the resulting organometallic compound is one of tetraquis (dimethylamino)silane and tetraquis(diethylamino)silane.

21. A solution raw material containing an organometallic compound according to claim 1 dissolved in an organic solvent.

22. A solution raw material containing an organometallic compound according to claim 2 dissolved in an organic solvent.

23. A solution raw material containing an organometallic compound according to claim 3 dissolved in an organic solvent.

24. A solution raw material comprising an organometallic compound according to claim 4 dissolved in an organic solvent.

25. A solution raw material comprising an organometallic compound obtained by a synthesis method according to claim 5 dissolved in an organic solvent.

26. A solution raw material comprising an organometallic compound obtained by a synthesis method according to claim 6 dissolved in an organic solvent.

27. A solution raw material according to claim 21, wherein said organic solvent is at least one type of compound selected from the group consisting of n-alkane, tetrahydrofuran, cyclohexane, cycloalkane and branched alkane.

28. A solution raw material according to claim 22, wherein said organic solvent is at least one type of compound selected from the group consisting of n-alkane, tetrahydrofuran, cyclohexane, cycloalkane and branched alkane.

29. A solution raw material according to claim 23, wherein said organic solvent is at least one type of compound selected from the group consisting of n-alkane, tetrahydrofuran, cyclohexane, cycloalkane and branched alkane.

30. A solution raw material according to claim 24, wherein said organic solvent is at least one type of compound selected from the group consisting of n-alkane, tetrahydrofuran, cyclohexane, cycloalkane and branched alkane.

31. A solution raw material according to claim 25, wherein said organic solvent is at least one type of compound selected from the group consisting of n-alkane, tetrahydrofuran, cyclohexane, cycloalkane and branched alkane.

32. A solution raw material according to claim 26, wherein said organic solvent is at least one type of compound selected from the group consisting of n-alkane, tetrahydrofuran, cyclohexane, cycloalkane and branched alkane.

33. A metal-containing thin film produced by metal organic chemical vapor deposition using an organometallic compound according to claim 1.

34. A metal-containing thin film produced by metal organic chemical vapor deposition using an organometallic compound according to claim 2.

35. A metal-containing thin film produced by metal organic chemical vapor deposition using an organometallic compound

according to claim 3.

36. A metal-containing thin film produced by metal organic chemical vapor deposition using an organometallic compound obtained by a synthesis method according to claim 5.

37. A metal-containing thin film produced by metal organic chemical vapor deposition using an organometallic compound obtained by a synthesis method according to claim 6

38. A metal-containing thin film produced by metal organic chemical vapor deposition using a solution raw material according to claim 21.

39. A metal-containing thin film produced by metal organic chemical vapor deposition using a solution raw material according to claim 22.

40. A metal-containing thin film produced by metal organic chemical vapor deposition using a solution raw material according to claim 23.

41. A metal-containing thin film produced by metal organic chemical vapor deposition using a solution raw material according to claim 24.

42. A metal-containing thin film produced by metal organic chemical vapor deposition using a solution raw material according to claim 25.

43. A metal-containing thin film produced by metal organic chemical vapor deposition using a solution raw material according to claim 26.